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Huang

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(54) **UPRIGHT CHUCK ASSEMBLY**

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B23B 31/163 (2006.01)
B23B 31/16 (2006.01)
B23B 31/24 (2006.01)

(52) **U.S. Cl.**
CPC **B23B 31/16083** (2013.01); **B23B 31/16004** (2013.01); **B23B 31/24** (2013.01); **B23B 2231/00** (2013.01); **B23B 2260/07** (2013.01); **Y10T 279/17** (2015.01); **Y10T 279/1933** (2015.01)

(58) **Field of Classification Search**
CPC B23B 31/16004; B23B 31/16083; B23B 31/24; B23B 2260/07
USPC 279/114–116
See application file for complete search history.

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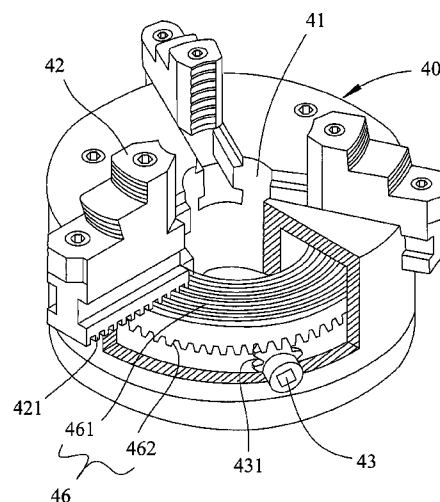
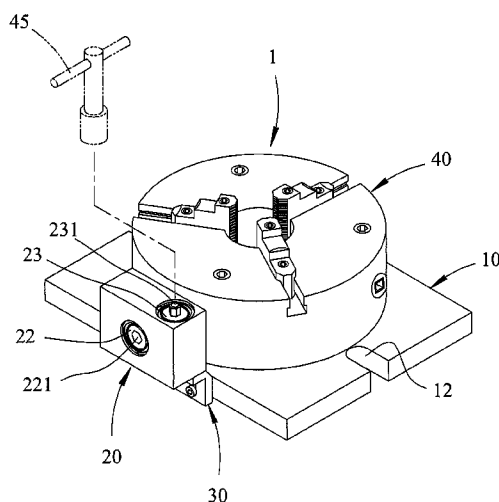
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(57) **ABSTRACT**

An upright chuck assembly includes a base having two elongate notches respectively defined in two sides thereof. A rotary device is connected to the base and includes a horizontal gear set and a vertical gear set which are engaged with the horizontal gear set in the body of the rotary device. An insertion extends from the horizontal gear set and is inserted into one of the adjustable members. The vertical gear set has a connection portion on the top thereof, and a T-wrench is mounted to the connection portion. The rotary device is cooperated with a vertical machine center.

3 Claims, 11 Drawing Sheets



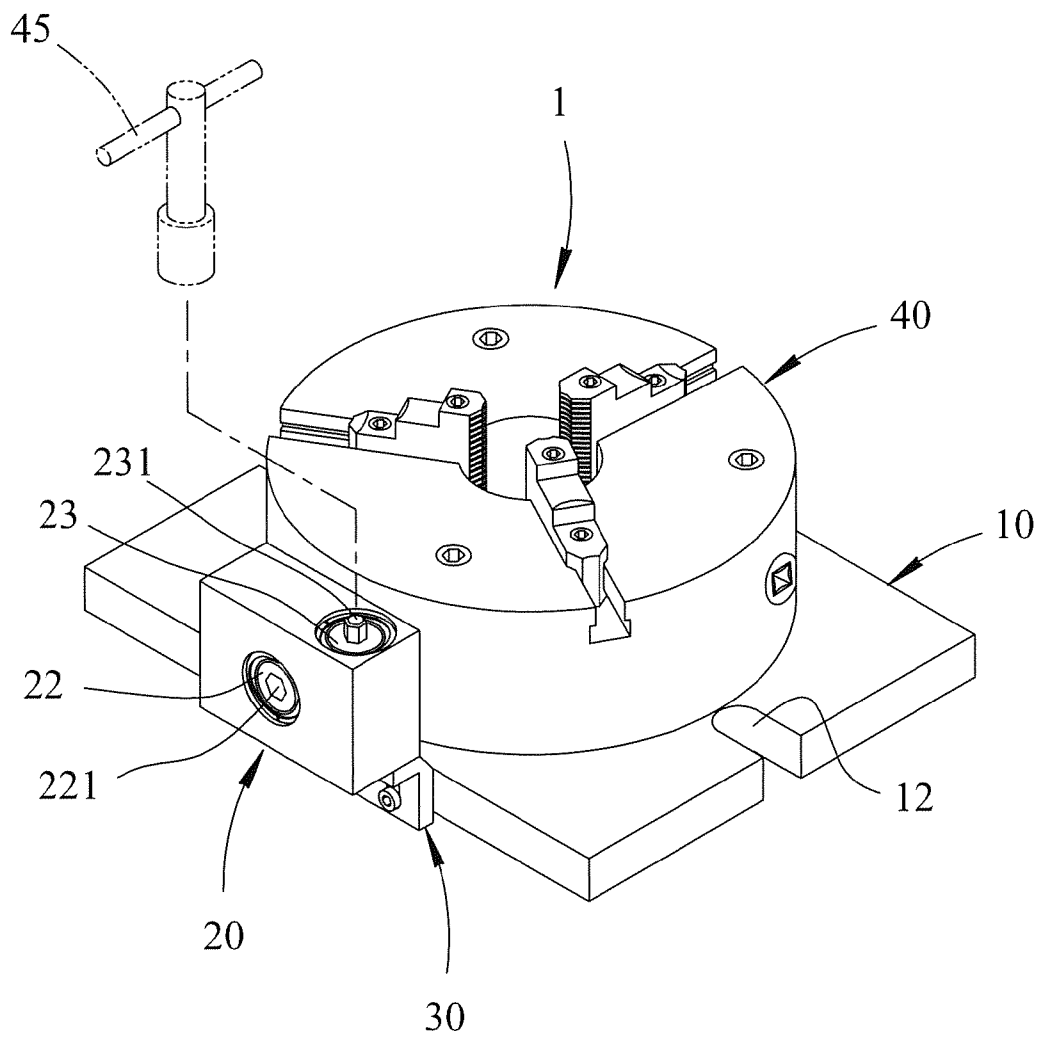


FIG.1

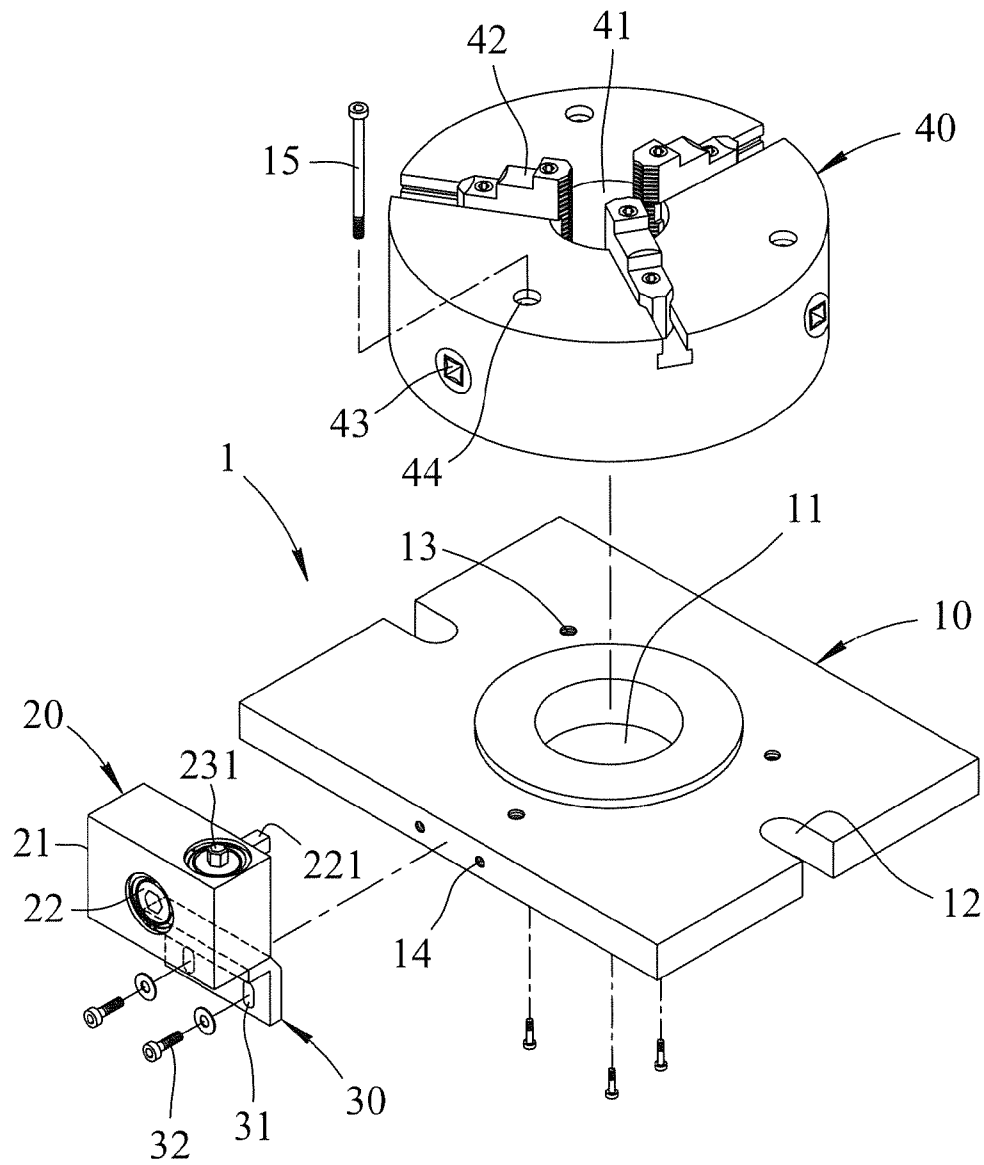


FIG.2

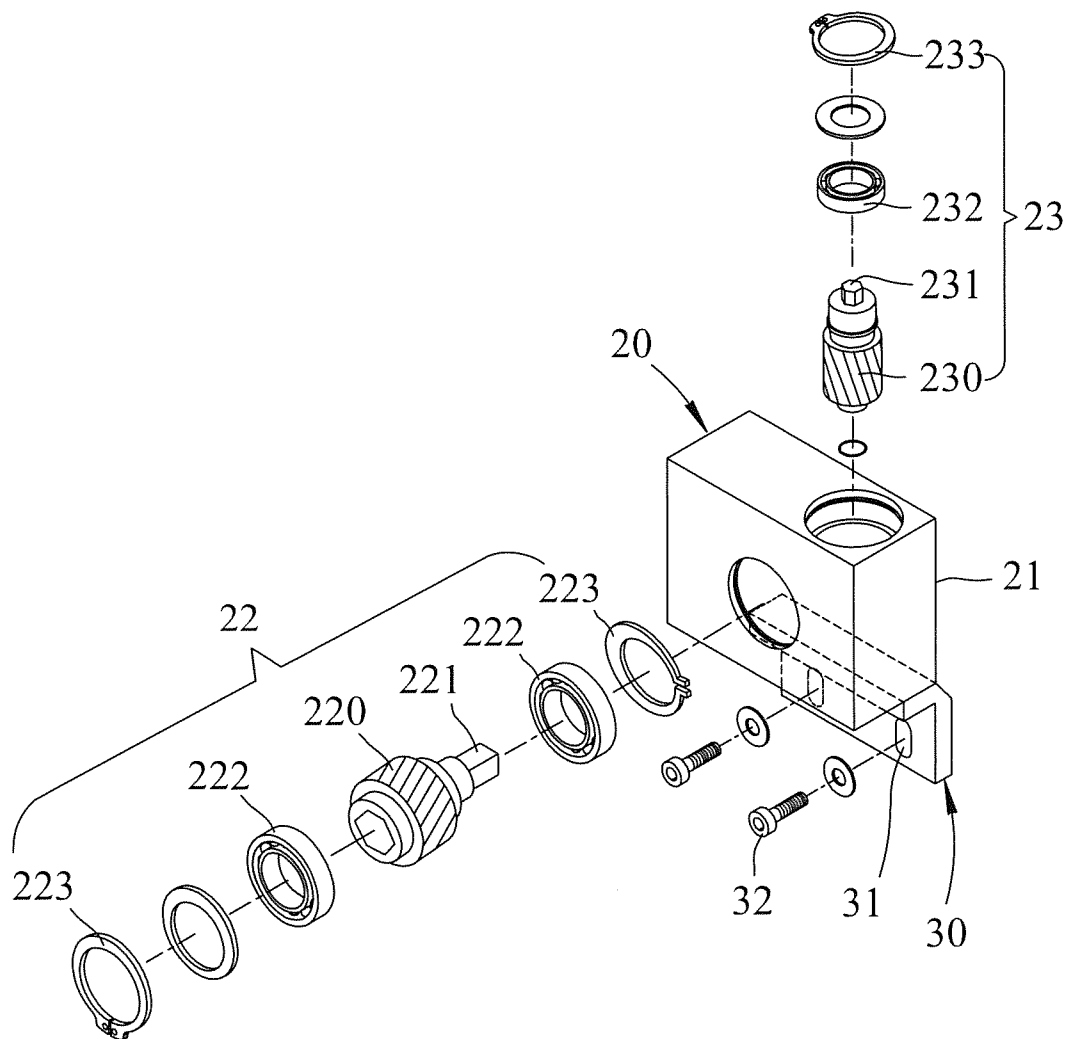


FIG.3

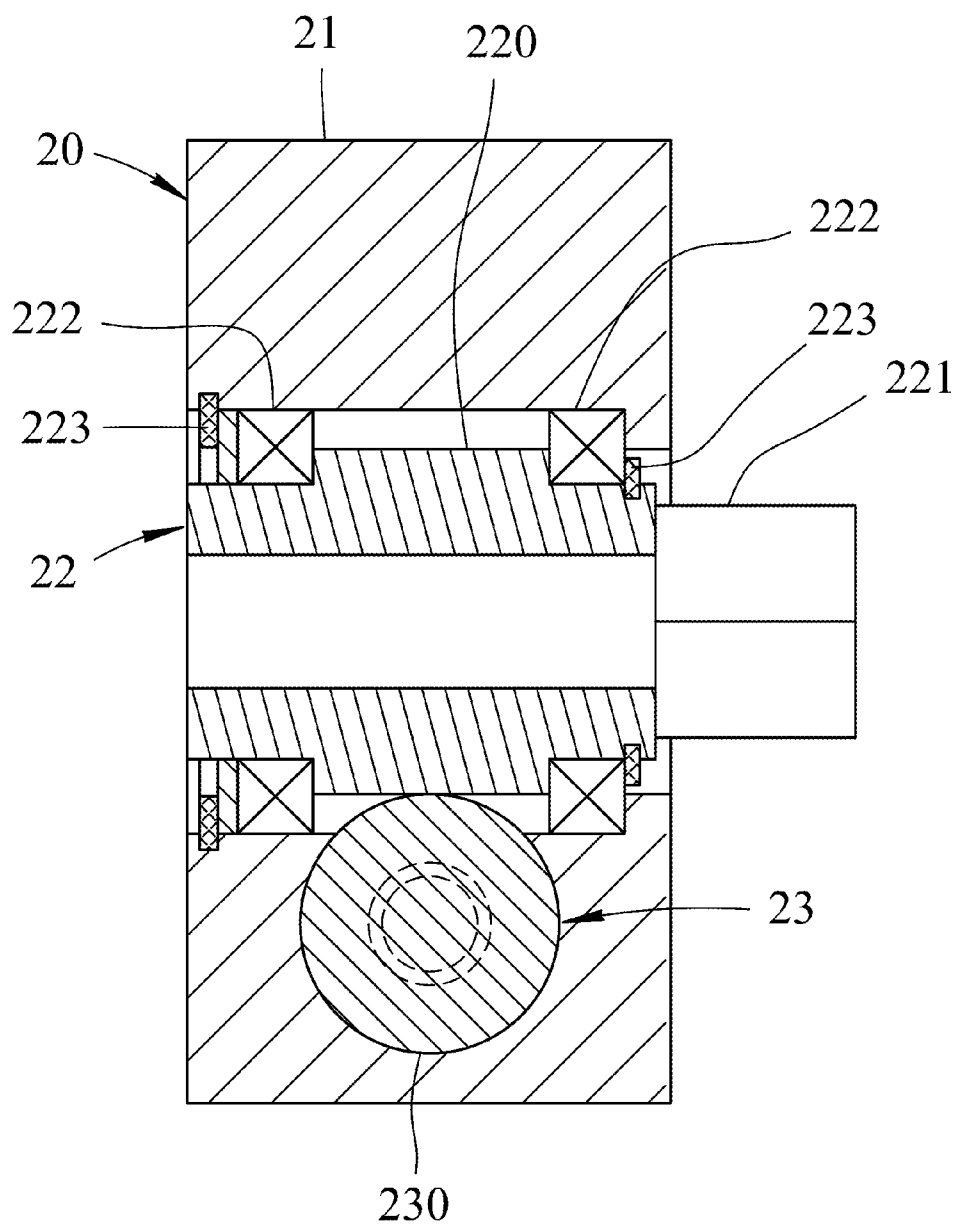


FIG.5

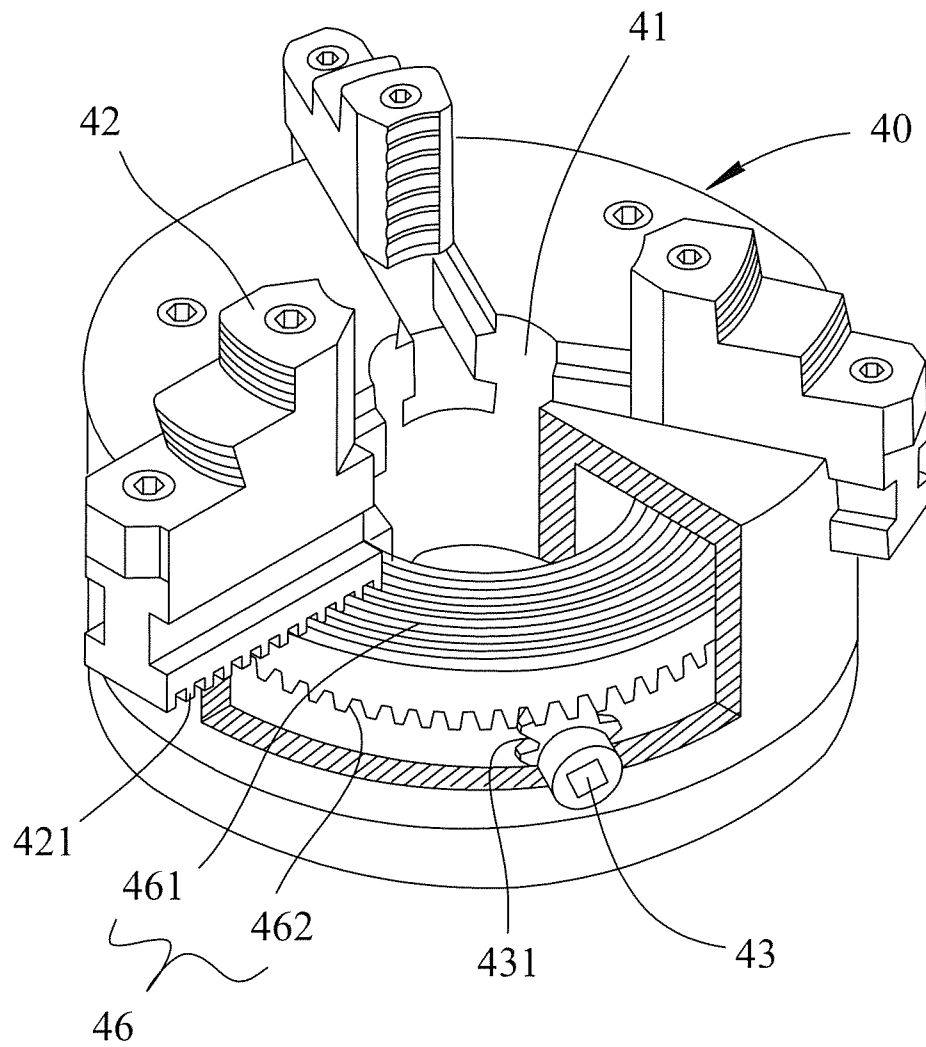


FIG. 6

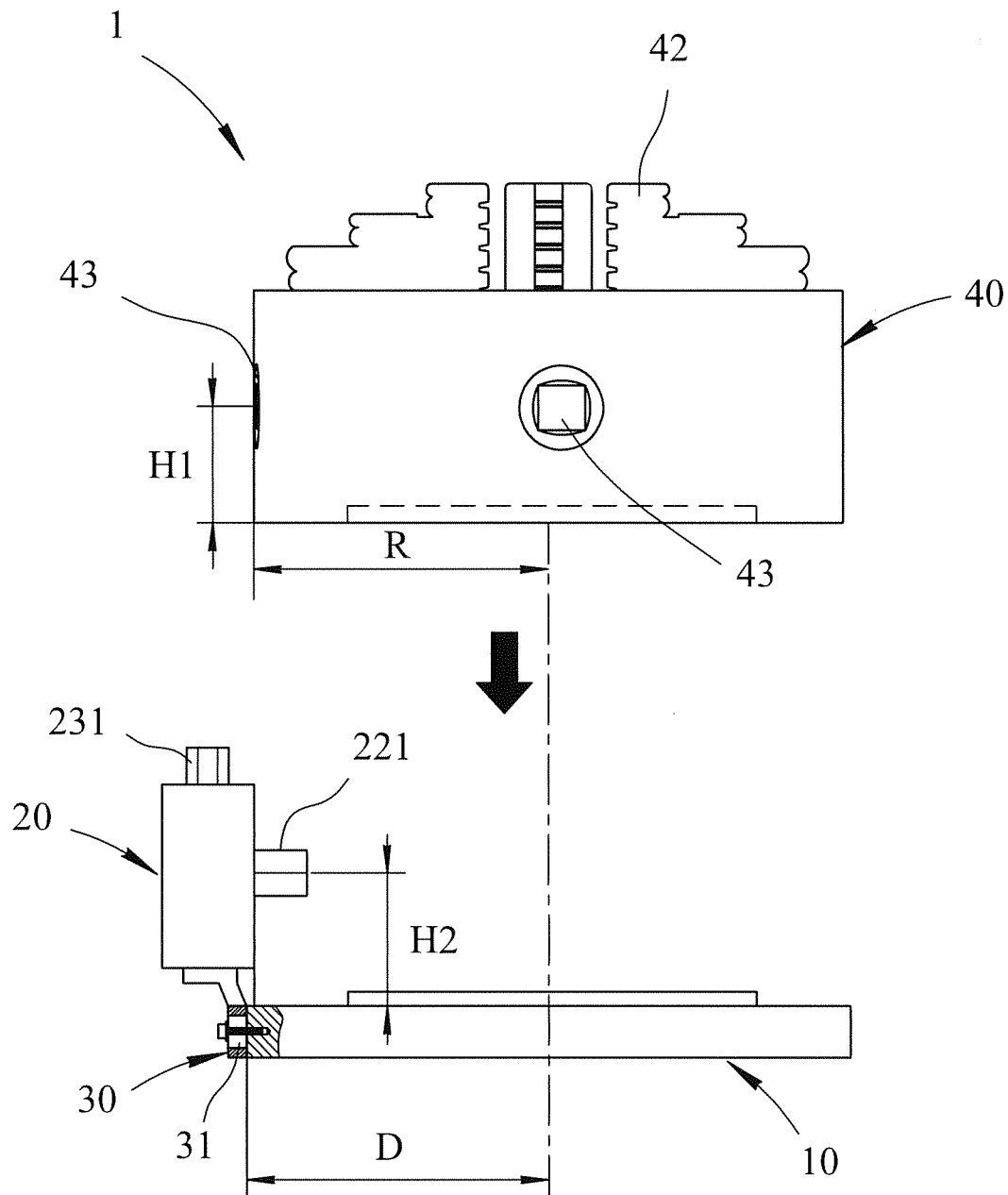


FIG.7

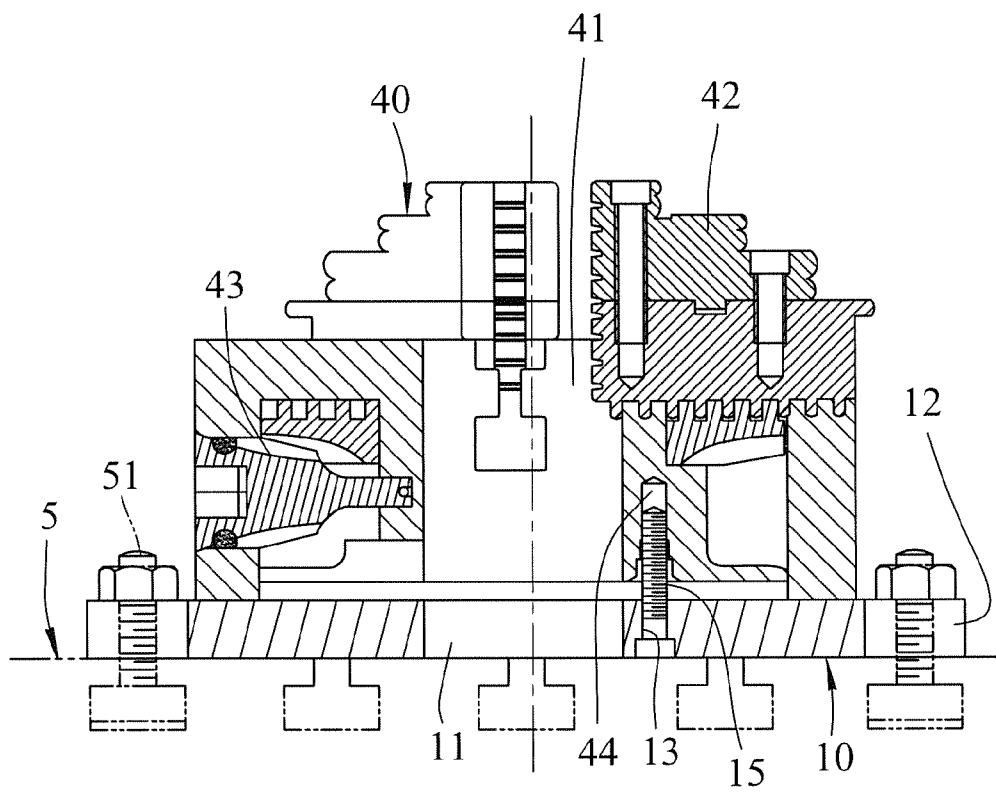


FIG.8

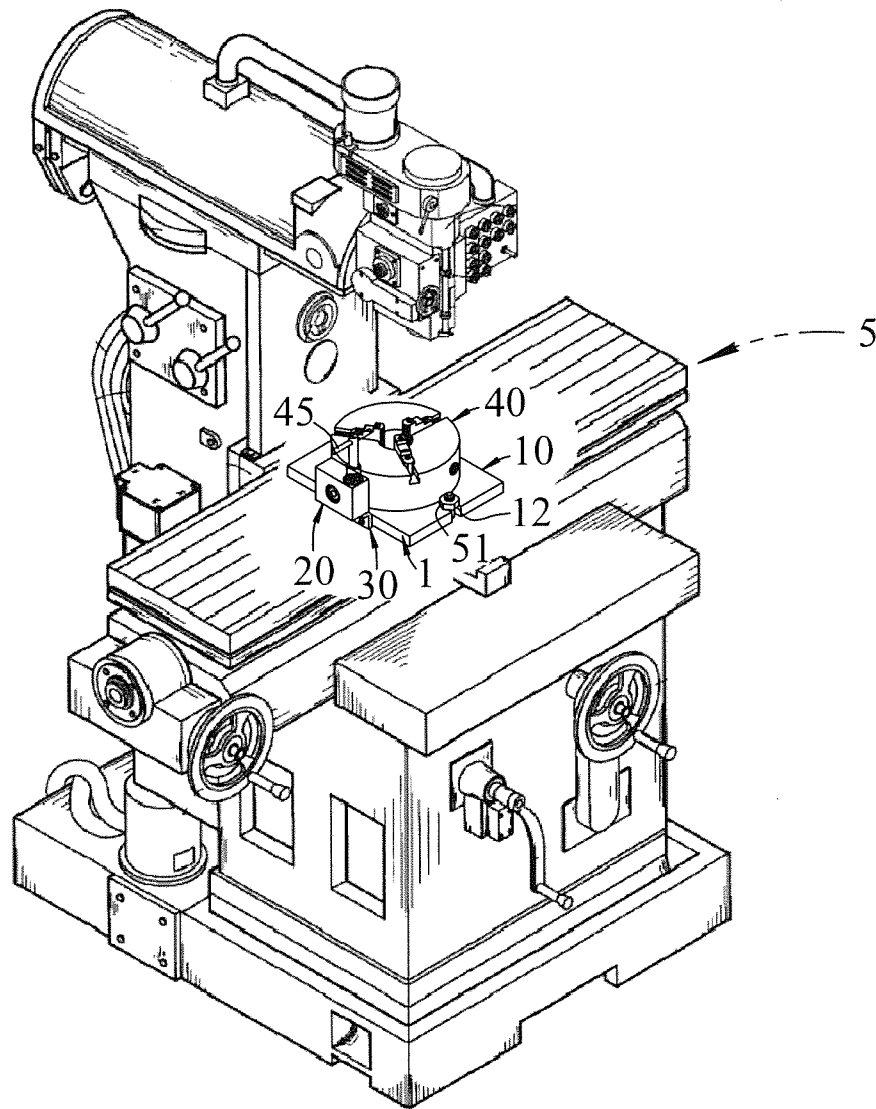


FIG.9

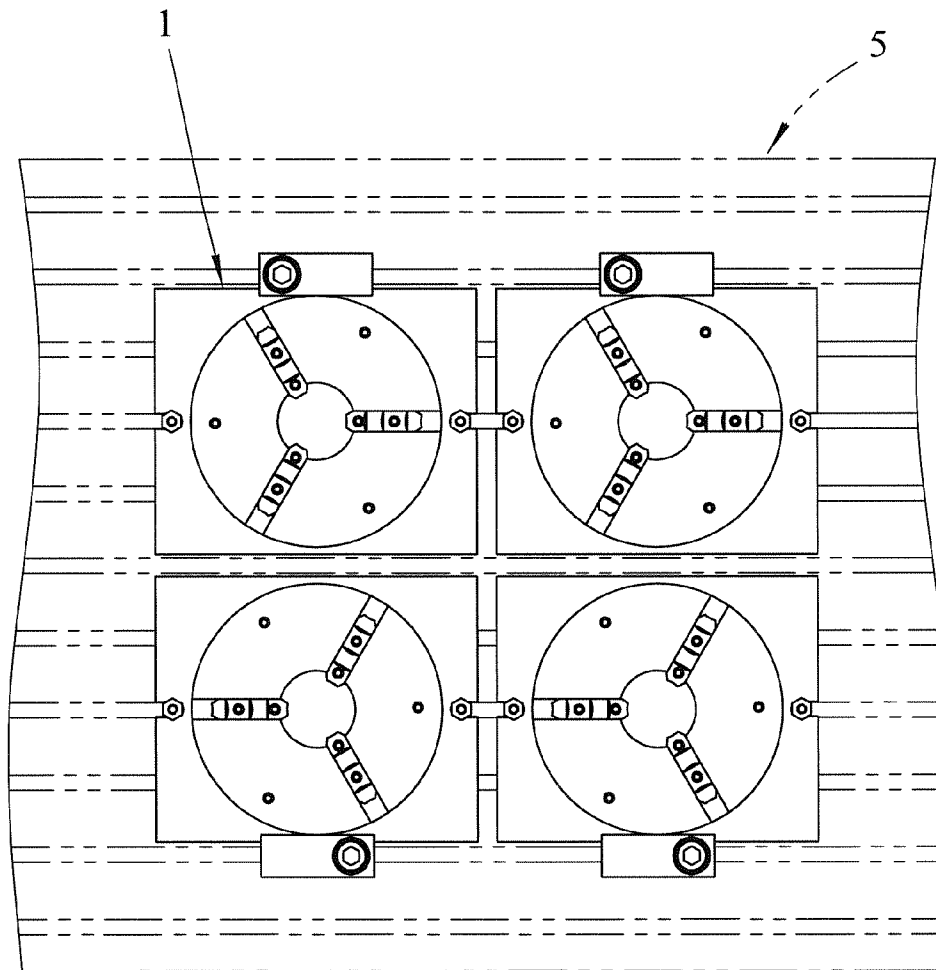


FIG.10

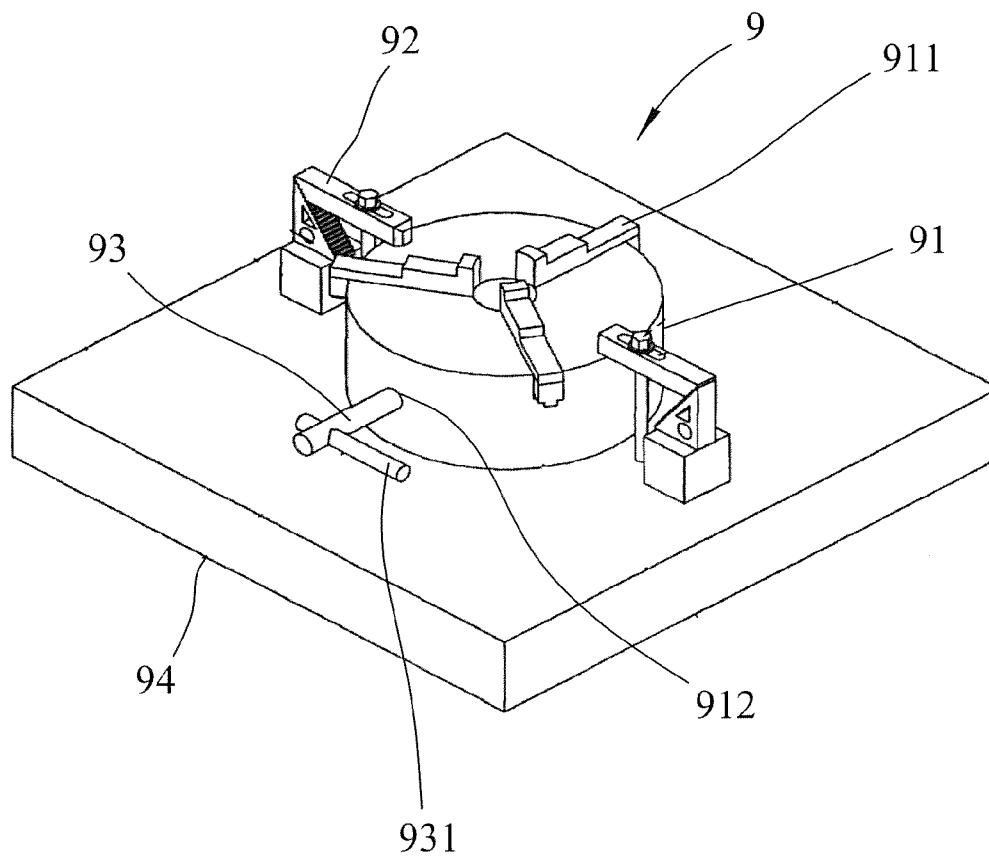


FIG.11

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UPRIGHT CHUCK ASSEMBLY**BACKGROUND OF THE INVENTION****1. Fields of the invention**

The present invention relates to a chuck assembly, and more particularly, to an upright chuck assembly.

2. Descriptions of Related Art

The conventional chuck assembly is used on a machine center which can be a horizontal machine center or a vertical machine center. Each of the two types of machine center has a chuck assembly. Vise is usually cooperated with a milling machine, drilling machine. Chuck is usually cooperated with a lathe.

As shown in FIG. 11 which shows the China Patent No. CN202741779U and discloses a chuck assembly 9 which has a chuck unit 91 with three pawls 911 on a work bench 94, and multiple blocks 92 fix the chuck unit 91 on the work bench 94. The three pawls 911 automatically position a cylindrical object at the center of the chuck assembly so as to be machined conveniently.

When the three pawls 911 are released from the object, a T-wrench 93 has to be inserted into an adjustment member 912 and rotated. However, the T-wrench 93 is located horizontally and the handle of the T-wrench 93 will be interfered with the work bench 94 so that the T-wrench 93 cannot be rotated 360 degrees. This is not convenient for the user to operate the T-wrench 93.

The present invention intends to provide an upright chuck assembly which is easily and conveniently operated. Besides, the present invention can be used to upright machine centers of different sizes.

SUMMARY OF THE INVENTION

The present invention relates to an upright chuck assembly and comprises a chuck unit having a passage and multiple adjustment members. The chuck unit has multiple connection holes. A base has a central hole, and two elongate notches are respectively defined in two sides of the base. Multiple first holes are defined in the base and located beside the central hole. Multiple bolts extend through the first holes to connect the base to the chuck unit. A rotary device has a body, a horizontal gear set and a vertical gear set. The horizontal gear set and the vertical gear set are engaged with each other in the body. An insertion extends from the horizontal gear set and is inserted into one of the adjustable members to connect the horizontal gear set to the base. The vertical gear set has a connection portion on the top thereof. A T-wrench is mounted to the connection portion.

Preferably, the rotary device has an extension extending therefrom and the extension is connected to second holes defined in one side of the base by extending multiple bolts through holes in the extension. Each of the through holes is an oval hole and the bolts are adjustable in the through holes.

The present invention has advantages, wherein the insertion of the horizontal gear set is inserted into one of the adjustable members, and the T-wrench is mounted to the connection portion connection portion on the top of the vertical gear set to control the operation of the chuck unit relative to the object. The chuck unit can be cooperated with existed base, rotary device and extension to easily install the chuck device to the vertical machine center at very low cost.

Besides, the through holes of the extension each are oval holes so that the rotary device can be adjustably connected with chuck devices of different brands.

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The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view to show the chuck assembly the of the present invention;

FIG. 2 is an exploded view of the chuck assembly of the present invention;

FIG. 3 is an exploded view of the rotary device of the chuck assembly of the present invention;

FIG. 4 is a cross sectional view of the chuck assembly of the present invention;

FIG. 5 is a cross sectional view of the rotary device of the chuck assembly of the present invention;

FIG. 6 is a perspective view of the rotary device of the chuck assembly of the present invention;

FIG. 7 shows the relative positions between the height H1 of the chuck device and the height H2 of the rotary device, and between the distance D and the distance R of the chuck device;

FIG. 8 is a cross sectional view to show that the chuck assembly of the present invention is installed to a work bench;

FIG. 9 is a perspective view to show that the chuck assembly of the present invention is installed to a vertical machine center;

FIG. 10 shows that multiple chuck assemblies of the present invention are installed to a work bench, and

FIG. 11 shows a conventional chuck assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 to 6, the chuck assembly 1 of the present invention comprises a base 10, a rotary device 20, an extension 30 and a chuck unit 40.

The base 10 has a central hole 11 so that debris during machining drop to the work bench 5 via the central hole 11. Two elongate notches 12 are respectively defined in two sides of the base 10 and two bolts extend through the notches 12 to fix the chuck assembly 10 to the work bench 5. Multiple first holes 13 are defined in the base 10 and located beside the central hole 11. Multiple second holes 14 are defined in one side of the base 10.

The rotary device 20 comprises a body 21, a horizontal gear set 22 and a vertical gear set 23. The horizontal gear set 22 and the vertical gear set 23 are engaged with each other in the body 21. An insertion 221 extends from the horizontal gear set 22 and is inserted into one of the adjustable members 43 to connect the horizontal gear set 22 to the base 10. The size of the insertion 221 is vary to be connected with the chuck units of different brands. The vertical gear set 23 has a connection portion 231 on the top thereof, and a T-wrench 45 is mounted to the connection portion 231. As shown in FIGS. 3 and 5, the horizontal gear set 22 has a first gear rod 220 and two bearings 222 are connected to two ends of the first gear 220. The first gear rod 220 and two bearings 222 are connected to the body 21 by using two C-clips 223. The insertion 221 of the horizontal gear set 22 can be a rectangular rod, a pentagonal rod or a hexagonal rod so as to be easily engaged with the adjustment members 43 and to rotate the adjustment members 43. The vertical gear set 23 has a second gear rod 230 and two bearings 232 are connected to two ends of the second gear 230. The second gear rod 230 and two bearings 222 are

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connected to the body **21** by using at least one C-clips **233**. The horizontal and vertical gear sets **22**, **23** are perpendicularly engaged with each other. The connection portion **231** of the vertical gear set **23** is a rectangular hole, a pentagonal hole or a hexagonal hole, or a rectangular rod, a pentagonal rod or a hexagonal rod so as to be cooperated with the T-wrench **45** to rotate the rotary device **20**.

The extension **30** is connected to the lower end of the rotary device **20** and bolts **32** extend through the through holes **31** of the extension **30** to fix the extension **30** to the second holes **14** of the base **10**, so as to support and fix the rotary device **20**. It is noted that the through holes **31** each are oval holes and the bolts **32** are adjustable in the through holes **31**.

As shown in FIGS. **4** and **6**, the chuck unit **40** is manufactured into different sizes and has a passage **41** and multiple adjustment members **43** located around the chuck unit **40**. The chuck unit **40** has multiple connection holes **44**. A disk **46** is rotatably located in the chuck unit **40** and has spiral teeth **461** defined in a first surface thereof, and multiple teeth **462** are defined in a second surface of the disk **46**. Each adjustment member **43** has a bevel gear **431** which is engaged with the teeth **462** of the disk so as to rotate the disk **46**. The spiral teeth **461** are engaged with the toothed portion **421** of the pawls **42** of the chuck unit **40** such that the disk **46** drives the pawls **42** to be simultaneously moved relative to the center of the chuck unit **40**.

As shown in FIGS. **2**, **7** and **8**, the chuck unit **40** is installed to the base **10** and the connection holes **44** of the chuck unit **40** are located in alignment with the first holes **13**, the bolts **15** extend through the connection holes **44** of the chuck unit **40** and are connected to the first holes **13** to fix the chuck unit **40** to the base **10**. The insertion **221** of the horizontal gear set **22** is inserted into one of the adjustment members **43** of the chuck unit **40**, and the bolts **32** extend through the through holes **31** to fix the extension **30** to the first holes **13** of the base **10**.

As shown in FIG. **7**, the chuck unit **40** is a standard product which can be made into different sizes and specifications so that the chuck unit **40** may have different height. The height **H1** of the adjustment members **43** of the chuck unit **40** is equal to the height **H2** of the horizontal gear set **22** of the rotary device **20**. The distance **D** from the center of the base **10** to the rotary device **20** is cooperated with the radius **R** of the chuck unit **40** so that when the rotary device **20** is installed to the base **10**, the insertion **221** is able to be inserted into the adjustment members **43**. In order to allow the chuck assembly **1** of the present invention to be cooperated with the different heights **H1** of the adjustment members **43** of the products of

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different brands, the through holes **31** are oval holes so that the height **H2** can be adjusted when needed.

As shown in FIG. **9**, when in use, the chuck assembly **1** is installed to a work bench **5** and operated in vertical direction. The fixing bolts **51** are used to extend through the two elongate notches **12** to fix the chuck assembly **1** to the work bench **5**. The T-wrench **45** is mounted to the connection portion **231** of the vertical gear set **23** to control the pawls **42** to clamp the object or not. The operation of the T-wrench **45** does not interfere the work bench **5**. As shown in FIG. **10**, multiple chuck assemblies **1** of the present invention can be installed to the work bench **5** to increase the efficiency of work.

While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. An upright chuck assembly comprising:

a chuck unit having a passage and multiple adjustment members, the chuck unit having multiple connection holes;

a base having a central hole, two elongate notches respectively defined in two sides of the base, multiple first holes defined in the base and located beside the central hole, multiple bolts extending through the first holes to connect the base to the chuck unit, and

a rotary device having a body, a horizontal gear set and a vertical gear set, the horizontal gear set and the vertical gear set being engaged with each other in the body, an insertion extending from the horizontal gear set and inserted into one of the adjustable members to connect the horizontal gear set to the base, the vertical gear set having a connection portion on a top thereof, a T-wrench being mounted to the connection portion;

wherein the rotary device has an extension extending therefrom and the extension is connected to second holes defined in one side of the base by extending multiple bolts through through-holes in the extension, the through-holes each are oval holes and the bolts are adjustable in the through-holes.

2. The upright chuck assembly as claimed in claim 1, wherein the insertion of the horizontal gear set is a rectangular rod, a pentagonal rod or a hexagonal rod.

3. The upright chuck assembly as claimed in claim 1, wherein the connection portion of the vertical gear set is a rectangular hole, a pentagonal hole or a hexagonal hole, or a rectangular rod, a pentagonal rod or a hexagonal rod.

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